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mass of gas, to which the author has previously called attention, appear to be increased by these additional facts of observation.

J. H. MOORE.

NOTE ON THE NEBULAR DISK OF NOVA AQUILAE No. 3

Nova Aquilae, No. 3 was examined with the 36-inch telescope on the nights of June 4th, June 8th and July 7th. It was noted on the first night that the blue-green nebulous envelop or halo which was so conspicuous in 1920 had become very much fainter and apparently larger, but the seeing on this night and on June 8th was not good enough to permit accurate measures. On July 7th the observing conditions were very good and, the nebulous envelop, tho faint, was well defined (at the focus for the nebulum lines 8^{mm} outside of the normal stellar focus) and much larger than the out-of-focus star image. The diameters, north-south and east-west, were measured, the results being, respectively, 5".07 and 4".98. The disk appeared to be perfectly round and the star to be placed centrally within it.

ROBERT G. AITKEN.

THE APPARENT DISTRIBUTION OF THE NOVAE

It is well-known that the novae are concentrated toward the belt of the Milky Way, and it has sometimes been thought that the probability for the outburst of a nova in any given part of the sky is proportional to the star density in that area. If this were true we should expect to find novae more frequently in the bright star clouds of the Milky Way than elsewhere.

The galactic distribution of 45 objects considered to be *bona fide* galactic novae (the novae in spiral nebulae and in globular clusters are excluded) shows that this supposed law does not hold. Plots made on the basis of Pickering's diagram of the 18 hour region of the galaxy and Graff's curves for equal light intensity for the 6 hour region show that novae are not situated in the brightest regions of the Milky Way. They prefer places where the light intensity is low, as at the borders of the galaxy or of the so-called "coal-sacks." From Nort's diagram¹ of the light intensity and star density in the Milky Way it would seem that novae occur rather in the regions of low light intensity than in those where the star density is small.

¹*Recherches astronomiques de l'observatoire d' Utrecht VII.*

Now the relationship between light intensity and star density in the Milky Way is not yet clearly established, but it would seem that the variation in light intensity corresponds to the distribution of the diffuse bright and dark nebulae. The distribution of the dark nebulae studied by Barnard also shows some general features similar to those of the distribution of the novae. The fact that some novae have occurred in dark lanes (*Nova Aquilae* No. 2, η *Argus* [?], *Nova Aquilae* No. 3) also indicates the possibility that novae are related with the nebular matter in our universe.

These arguments strengthen the earlier conclusion that the novae are typical galactic objects. Further, the diagrams of their apparent distribution show that there is a conspicuous concentration of novae in the very region (*Sagittarius-Scorpius*) where recent investigations place the distant center of our stellar system. If we assume the mean distance to the novae in this region to be the same as that to the globular clusters in the same region, we may derive a mean parallax for the novae by using the cluster parallaxes suggested by Shapley and by the writer. We thus find that the absolute magnitude of the novae at maximum must have been very high, in the mean -9^m ; a conclusion that is supported by other investigations that will be dealt with in a later paper.

The planetary nebulae show the same general distribution as the novae; they avoid the brightest spots in the Milky Way and their concentration in the *Sagittarius* region is conspicuous. Their mean absolute magnitude appears to be about 0^m ; a result that would harmonize with the suggestion that the planetaries have developed from novae since the mean difference between the maximum and minimum brightness of the latter is about 10 magnitudes.

If we consider the distribution of the novae in galactic longitude we find two other interesting features in addition to their concentration in *Sagittarius-Scorpius*:

(1) A nova has never been observed between 187° and 255° galactic longitude. The position in the heavens of this region is not such that the gap can be explained by assuming that it has been very little observed.

(2) The novae 180° distant in longitude from the *Sagittarius-Scorpius* region seem to be somewhat more widely distributed in galactic latitude than those which we find in the direction of the center of our system.

KNUT LUNDMARK.

Mount Hamilton, Cal., July 15, 1921.